METHODS AND SYSTEMS FOR CONTROLLING THE OPERATION OF A TOOL

ABSTRACT OF THE DISCLOSURE

Methods and systems for controlling the operation of a tool are provided. These methods and systems may be used to control the operation of any tool, for example, a drill or a saw. The methods and systems employ at least one sensor to detect at least one operational parameter of the tool, for example, drill speed or acceleration. Instrumentation is used to process the data representing the parameter to determine characteristic values of the parameter, for example, amplitudes and frequencies. These characteristic values are used to control the operation of the tool, to determine one or more properties of the material being acted on by the tool, or to monitor the condition of the tool. Though aspects of the invention may be applied to a broad range of tools and machining processes, in one aspect, the methods and systems are used to monitor and control the operation of a surgical drilling process, for example, for the drilling of bone.